



No. 22,599/29.

APPLICATION DATED

23rd September, 1929.

Applicant (Assignee of Actual Inventor) .. ASSOCIATED ELECTRICAL INDUSTRIES LIMITED.
Actual Inventor .. JOHN BENTLEY HANSELL, of England.
Application and Complete Specification .. Accepted, 24th January, 1930.
Acceptance Advertised (Sec. 50) .. 4th February, 1930.

Class 02.6.

Drawing attached.

COMPLETE SPECIFICATION.

"Improvements in or relating to oil tanks for oil-immersed electrical apparatus, such as transformers."

We, ASSOCIATED ELECTRICAL INDUSTRIES LIMITED, Manufacturers, of Bush House, Aldwych, London, England, hereby declare this invention and the manner in which it is to be performed to be fully described and ascertained in and by the following statement:—

This invention relates to the oil tanks of oil-immersed electrical apparatus such as transformers, circuit breakers and the like in which heat will be generated during operation.

It is obvious that if such tanks are entirely filled with the oil the expansion due to the heating up of the electrical apparatus, hereinafter referred to simply as the transformer, or the occurrence of an electrical fault in a winding, must result either in a leakage of oil with a subsequent inflow of air during cooling, or even in the bursting of the tank.

It has heretofore been a common practice to provide a space for a body of air overlying the surface of the oil, but when considerable expansion has to be taken care of, such space must be made so large as to increase the size of the tank undesirably or a release valve must be provided permitting the escape of the enclosed air at a predetermined pressure and the subsequent inflow of air during cooling. However, the oxygen and moisture contents of air are injurious to the oil commonly used and although a non-injurious gas can be used

instead of the air it is then impossible to employ the release valve mentioned above unless a comparatively large reserve supply of the gas is available. To overcome this difficulty it has been proposed to fill the over-space with dry nitrogen and to associate with the air inlet valve an apparatus containing one or more substances which extract some or all of the moisture and oxygen from the incoming air. It has further been proposed to connect the over-space containing a non injurious gas to an expansion chamber which may be in the form of a loaded or counterbalanced gasometer to provide a substantially constant pressure.

According to the present invention, there is provided in or associated with the oil Tank a closed or fluid-sealed expansion space or chamber which contains a gas or vapour and a material which is capable of accommodating comparatively large changes of volumes of said gas or vapour for relatively small changes of pressure.

In order that the invention may be fully understood it will now be described with reference to the accompanying drawing in which—

Figs. 1 and 2 show by way of example embodiments of the invention applied to a transformer tank.

Referring to Fig. 1, the transformer is shown at 1 and is located within a closed tank 2, the usual terminal structure being indicated at 3. The transformer is im-

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a material which is capable of accommodating comparatively large changes of volume of said gas or vapour for relatively small changes of pressure thereof.

5 2. An oil tank according to Claim 1 in which an expansion space or chamber contains an inert gas such as carbon dioxide or nitrogen and a quantity of charcoal or coke to reversibly absorb or give off said gas on 10 changes of pressure thereof.

3. An oil tank according to Claim 1 in which the fluid-sealed expansion space or chamber is separated from the main body of oil in the tank which contains the electrical 15 apparatus, so that a gas (such as ammonia), which would attack the copper parts of the electrical apparatus may be provided in said chamber.

4. An oil tank according to Claim 3 in 20 which the fluid-sealed expansion space or chamber is separated from the main body of oil in the tank by a relatively flexible partition.

5. An oil tank according to Claims 3 and 25 4 in which the expansion space or chamber contains a liquid, for example water, to reversibly absorb or give off the gas on changes of pressure thereof.

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6. An oil tank according to Claim 1, in which a liquid and its vapour are provided in the expansion space or chamber, said liquid being chosen to give a suitable vapour pressure at normal atmospheric temperature, the space or chamber being located in a position which gives the requisite hydraulic head on the oil in the tank.

7. An oil tank according to any of the preceding claims, in which cooling means 10 are associated with the absorption material, for the purpose set forth.

8. An oil tank for oil-immersed electrical apparatus provided with a closed or fluid-sealed expansion space or chamber contain- 15 ing a gas and an absorbent material therefor substantially as described with reference to either of the forms shown in the accompanying drawing.

Dated this 23rd day of September, 1929. 20

ASSOCIATED ELECTRICAL INDUSTRIES
LIMITED.

By their Patent Attorney,
CLEM A. HACK.

Witness—H. McCawley.

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